RET Project: Power Predictions in PV Panels

Research Experience for Teachers (RET) Summer 2021
Deborah Sweeting, Mentors G. Muniraju and A. Spanias
SenSIP Center, School of ECEE, Arizona State University.

- Smart Monitor Devices (SMD) data collection on 14 solar features
- Use ML and Neural Networks to create optimal linear regression algorithm
- Predict DC Power output based on common solar array faults
- After collecting feature data, conduct principal component analysis to determine the importance of features
- Determining the effect of each feature on power outputs can allow for a simplification of the neural network
- **Share results and similar practice with high school students to stir up S.T.E.M. interest**

Figure 1.2: The SenSIP Solar Monitoring Facility at the ASU Research Park [8].

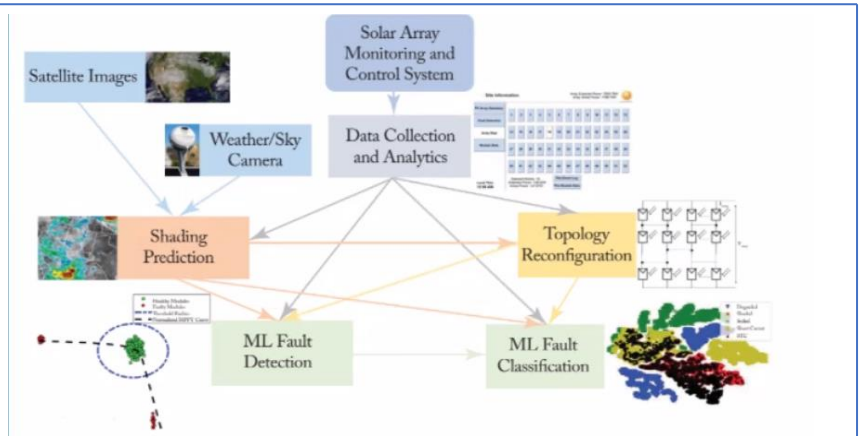
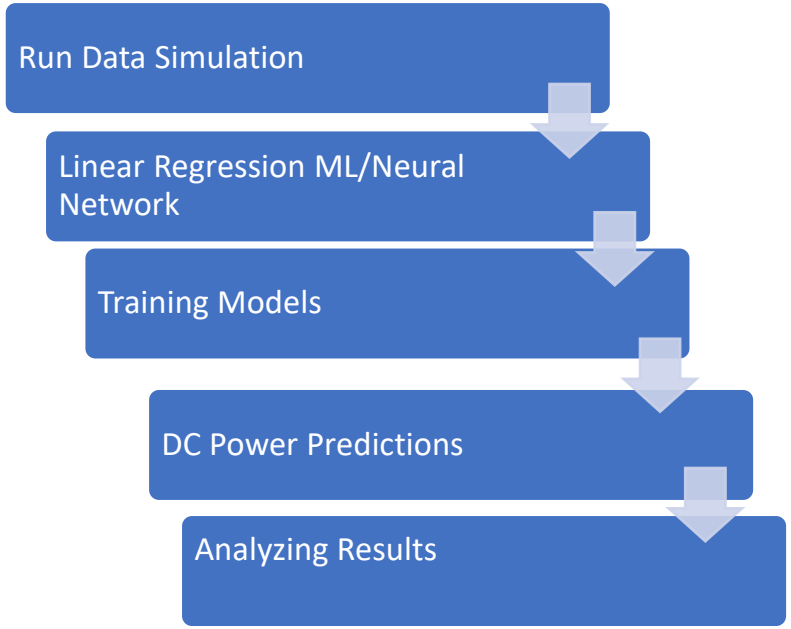
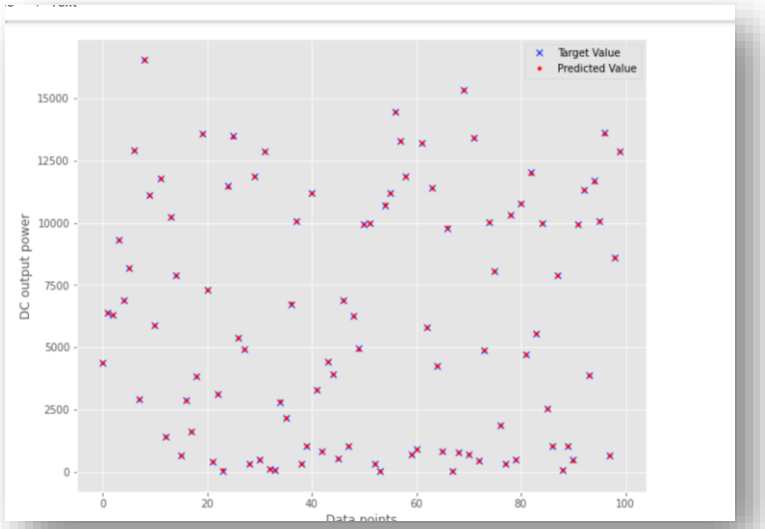


Figure 1.3: Systems and algorithms needed for a holistic solar array monitoring and control system. The direction of the arrow indicates the information flow. For instance, topology reconfiguration requires the PV current-voltage (I-V) measurement data and shading predictions in order to switch the connection topology. The information regarding the new topology is then passed on to the fault detection/classification stage.





NSF RET Award 1953745